



Annual Reports :: Year 6 :: NAI Central

Team Reports: NAI Central

**NAI Central**  
**Executive Summary**  
**Director: Bruce Runnegar**

## NAI Central Report

The organization of the administrative arm of the NAI is colloquially referred to as "NAI Central." This designation allows us to report the unique activities and projects led, organized or directly supported by the administrative office. These projects range from administration of the cooperative agreements with the Lead Teams to support for additional collaborations and initiatives of the NAI Director. NAI Central's projects often support or extend the efforts of the Lead Teams as well as reach out into the broader astrobiology community and help support the maintenance of the organization as a whole. The projects are categorized for the purposes of this report into support for collaborations in science and the international community, support for student training and early career programs, K-12 education and public outreach, and NAI's infrastructure. General information regarding these projects can also be found on the NAI's website at <http://nai.nasa.gov>

## Collaborations

### ***International Collaborations***

NAI currently has relationships with five international astrobiology organizations. Information regarding these partnerships can be found at [http://nai.arc.nasa.gov/institute/intl\\_partners.cfm](http://nai.arc.nasa.gov/institute/intl_partners.cfm). These partners are either Associates or Affiliates of the NAI; Associate status involves the exchange of confirming documentation by the sponsoring organization(s) of the international partner and the head of the NASA Office of External Affairs (on behalf of the NAI, and at the recommendation of the NAI.) NAI's interest in strengthening the international astrobiology community led us to focus our Executive Council meeting in April, 2005 on our present and potential international partners. In addition to representatives from our present Affiliates and Associates, we sponsored attendance by individuals representing potential partnerships in Canada, Japan, South Africa, Russia, Mexico, and Sweden.

In addition to our Associate and Affiliate members, NAI is one of eleven current participants in the Federation of Astrobiology Organizations, FAO. Through FAO astrobiology networks, associations, institutes, research groups, and societies cooperate their individual and international activities. A central emphasis of the Federation is in increasing the opportunities available to

talented students around the globe and supporting activities that develop their academic and research potentials. In collaboration with FAO, NAI supported the presentations of four NAI students at the Seventh Trieste Conference on Chemical Evolution and Origin of Life, a by–invitation meeting celebrating the 50 th anniversary of the Miller–Urey experiment. Dr. Stanley Miller attended the conference, and presented a retrospective of his work; this was a unique opportunity for students to interact directly with a legendary figure of astrobiology. Also in collaboration with FAO, and fellow FAO member the European Exo/Astrobiology Network Organization (EANA), NAI sponsored an informal junior/senior career level social and information exchange at the EANA annual meeting (Madrid, November 2004). More information on the FAO can be found at <http://www.astrobiology-fao.org/> .

#### **Astrobiology Drilling Program**

NAI Central initiated and supports the Astrobiology Drilling Program (ADP) as described in the Director's Letter for this report. This year, NAI Central provided funding for the Archean Biosphere Drilling Project and organized the steering committee. More information on the ADP can be found at <http://nai.arc.nasa.gov/adp/>

#### ***Josep Comas i Solà International Summer School in Astrobiology***

In partnership with the Centro de Astrobiología, NAI Central sponsors an interdisciplinary summer school. The course is intended to bring together students and researchers from Europe and the US to experience a focused workshop type environment on topics relevant to astrobiology. The course is offered at the Universidad Internacional Menéndez Pelayo campus in Santander, Spain. NAI Central provides travel support for the American faculty and travel and logistics for students from each of the NAI Teams to participate. *The Search for Life on Mars* was the first school held July 7–11, 2003. Speakers included Dr. Christopher McKay and Dr. Carol Stoker, both of NASA Ames Research Center, Dr. Paula Grunthaner from the Jet Propulsion Laboratory, Dr. Ricard Amils Pibernat from the Universidad Autónoma de Madrid, Dr. Juan Perez Mercader from the Centro de Astrobiología, and Dr. Bruce Runnegar from the NAI. Information regarding future courses can be found on the NAI website.

#### ***Remote Astrobiology Dialogues (RAD)***

Another specific international collaboration this year was the implementation of the Remote Astrobiology Dialogues (RAD) between the NAI and the Centro de Astrobiología (CAB). The goal of the RADs was the promotion of astrobiology research collaboration and scientific exchange. Four themes were chosen jointly with CAB and NAI leadership, and researchers were invited to participate using Polycom (room–based or desktop videoconference), WebEx (desktop), and telephone connections. Following each RAD, an interactive web gateway on each theme was available to support ongoing exchange with threaded discussions and ancillary supporting materials. Towards the end of the RAD series, NAI Deputy Director, Dr. Rose Grymes, traveled to the CAB to spend two weeks working remotely, from the CAB site, while meeting with researchers and students at CAB to solidify and expand NAI/CAB collaborations.

### ***Origins of Eukaryotes/Lateral Gene Transfer Workshop***

This invitational workshop was jointly organized by NAI and the Canadian Institute for Advanced Research (CIAR). The concept for this meeting was originally proposed by Dr. Hyman Hartman. By July, 2004, at the Gordon Research Conference on the Origins of Life, a steering committee for a workshop on the origins of eukaryotes was identified. Dr. Ford Doolittle, of CIAR's Evolutionary Biology Program, was a steering committee member. Through Dr. Doolittle's connections, information on a contemporaneously planned Lateral Gene Transfer workshop was exchanged, and a decision made to combine the two for maximal efficiency and impact. The participation of junior career astrobiologists was assured by permitting each member of the steering committee to identify and invite one such participant, without additional cost to the workshop budget. The on-site exchange was fruitful and exposed a consensus among the most prominent researchers in this field that was not yet evident in the published archive. A report on this meeting is being prepared by the NAI Senior Scientist. This partnership between NAI and CIAR led to interest from CIAR in affiliating with NAI, and underlies our plans to partner with CIAR for student travel and scientific sessions at the Second Earth Systems Processes conference in Calgary, August, 2005.

### **Cross-team and Community Collaborations**

#### **Focus Groups**

The purpose of the NAI program of Focus Groups is to coordinate expertise from across the Institute and the wider scientific community, and apply it towards the advancement of a defined area of research, mission planning, or other activity of particular importance to astrobiology. Several of the NAI Focus Groups reached the end of their three-year tenure during this past year. For those that renewed, NAI Central worked with the proposing Chair(s) to prepare a renewal proposal, distribute the material for review by the NAI EC, and schedule presentations. During this past year, NAI Central also organized breakout session of nearly all the Focus Groups at the Year 2004 AbSciCon Meeting at Ames Research Center. Throughout the year, NAI Central received requests from the current Focus Groups for funding to support workshops and other activities. These requests for activities received prompt attention and rapid turnaround. As in previous years, every effort was made to meet the schedule needs of the organizers. See the Focus Group section of the Annual Report for a summary of their activities.

#### ***Insight Courses***

In order to address the challenges of interdisciplinary science, NAI Central sponsored two courses aimed at educating scientists in one discipline in the core concepts and terminology of another discipline. During the summer of 2003, the "Introduction to Planetary Science for Non-planetary Scientists" and the "Introduction to the Microbial World for Non-microbiologists" provided rare opportunities for cross-disciplinary education aimed at career researchers in astrobiology. The planetary science course was led by Dr. Bruce Jakosky of the University of Colorado with lectures also provided by Dr. Vikki Meadows of the Jet Propulsion Laboratory, Dr. Bob Pappalardo from the University of Colorado, and Dr. Greg Laughlin from the University of California Santa Cruz. The course took place in Flagstaff, Arizona on July 31– August 4, 2003 and also included a field trip led by Dr. Jeff Plescia of the US Geological Survey.

The microbial world course was held on Catalina Island, California in August 2003 and was led by Dr. Ken Nealson (PI of the NAI JPL Team) of the University of Southern California. These courses were deemed very useful by the participants, however securing participation by working researchers in cross-disciplinary fields remains a challenge.

### ***Minority Institution Research Sabbaticals***

NAI Central supports a program for faculty at certified Minority Institutions to participate in research sabbaticals in astrobiology at NAI research sites. The Minority Institution Research Sabbatical (MIRS) aims to support collaborations in astrobiology that will lead to joint research proposals successful in peer review competitions. The program began in 2002 and has created 4 scientific collaborations to date. Successful applications have been received from Tennessee State University, Florida A & M University, and Howard University. The program also extends support to students of the participating faculty members to attend astrobiology science meetings and to become more familiar with the field of astrobiology. Applications have been accepted year round. The program is currently under review for refinement and more focused achievement of its goals.

### **Seminar Series**

Collaboration in a virtual institute requires multiple approaches. One of the NAI's successful efforts includes several seminar series using our videoconferencing systems and the collaborative meeting software product, WebEx. The Director's Seminars and the Forum for Astrobiology (FAR) seminars have become regular events and have had consistent audience turnout. The presenters of the Director's Seminars are senior scientists invited by the NAI Director. This year, NAI presented nine Director's Seminars. A highlight of this year's series was Dr. David J. Des Marais' presentation in February entitled "The Mars Exploration Rovers unveil new horizons for astrobiology" at which 14 of the 16 Lead Teams attended in addition to three other sites. Over 90 people attended at the various locations. Overall, the Director's seminars draw an average of eight sites with up to 20 people at each location.

For a complete listing of our seminars and abstracts from each presenter go to: <http://nai.arc.nasa.gov/seminars/index.cfm>

### **Workshops and Conferences**

The NAI supports numerous workshops, conferences and meetings each year as an additional mechanism for growing the overall community of astrobiology and for specific strategic goals and objectives of the Institute. These activities serve to train future astrobiologists, cultivate relationships with other international astrobiology organizations, and to advise NASA in its mission of exploration. During this past year NAI Central was instrumental in the success of, among others, the following activities:

- Cosponsorship of the Origins of Eukaryotes/Lateral Gene Transfer Workshop. This invitational workshop was jointly organized by NAI and the Canadian Institute for Advanced Research (CIAR). The concept for this meeting was originally proposed by Dr. Hyman Hartman. By July,

2004, at the Gordon Research Conference on the Origins of Life, a steering committee for a workshop on the origins of eukaryotes was identified. Dr. Ford Doolittle, of CIAR's Evolutionary Biology Program, was a steering committee member. Through Dr. Doolittle's connections, information on a contemporaneously planned Lateral Gene Transfer workshop was exchanged, and a decision made to combine the two for maximal efficiency and impact. The participation of junior career astrobiologists was assured by permitting each member of the steering committee to identify and invite one such participant, without additional cost to the workshop budget. The on-site exchange was fruitful and exposed a consensus among the most prominent researchers in this field that was not yet evident in the published archive. A report on this meeting is being prepared by the NAI Senior Scientist. This partnership between NAI and CIAR led to interest from CIAR in affiliating with NAI, and underlies our plans to partner with CIAR for student travel and scientific sessions at the Second Earth Systems Processes conference in Calgary, August, 2005.

- Co-Sponsorship of the "Seventh Conference on the Chemical Evolution and the Origin of Life" September 15–19, 2003 in Trieste, Italy. Support included attendance by NAI students, who gained exposure to the theme of the conference, "Life in the Universe". The awardees were: A. Erik Boice ( Indiana University ), Simon (Nicholas) Platts (Carnegie Institution of Washington), Margaret Turnbull ( University of Arizona ), and Steve Vance ( University of Washington ).
- NAI Co-Sponsoring of a Short-Course on Planetary Protection, November, 2003 (Baltimore, MD)
- Sponsorship of a Lunar Astrobiology Workshop, March 16, 2003 ( Houston, TX ), which resulted in a widely-distributed white paper on lunar exploration.
- Support of a Geological Society of America Pardee symposium entitled, "Neoproterozoic Geobiology: Fossils, Clocks, Isotopes, and Rocks" ( Nov. 2–5, 2003 )
- Cosponsorship and logistics for the Year 2003 Astrobiology Science Conference, held March 30– April 2, 2003 at Ames Research Center.
- Cosponsorship of the Mars Sample Return Meeting, held during February, 2004 in Pasadena, CA.

#### Student Training and Early Career Programs

##### Astrobiology Graduate Student Conference 2004

As described in the Director's Letter to this report, the University of Arizona organized and hosted a conference led by and for graduate students in astrobiology. NAI Central assisted the organizer, Maggie Turnbull, with refinement of the concept, logistics for the meeting, production and development of a webpage including online registration, and presentations to the participants about collaboration and funding opportunities within the NAI.

##### FAR Seminars

The FAR Seminars are another series of video-seminars produced by NAI. They began as a response to graduate student and postdoc requests for a

venue to meet, present their research, ask questions and discuss issues in astrobiology. The presenters are selected from volunteers who wish to give presentations, and this year 11 students presented their work. In April, the students agreed they would prefer to have two 25 minute presentations instead of one 50 minute presentation. That change was made and has been well received.

In 2003 and continuing into 2004, the University of Washington offered another student seminar series. The Graduate Astrobiology Seminar is broadcasted to the NAI community utilizing the NAI videoconferencing and collaboration tools. In the spring of 2004, four weekly lectures were broadcasted.

#### NAI/NRC Postdoctoral Fellowship Program

The NAI is committed to training future generations of astrobiology researchers. A major component of the NAI's investment towards this objective has been the NAI/NRC Postdoctoral Fellowship Program. Administered in cooperation with the National Research Council, of the National Academy of Sciences, the NAI/NRC Postdoctoral Fellowship Program has now supported 27 NAI Fellows, at 17 different host institutions. During this past year the NAI/NRC Program has increased its flexibility such that candidates can now submit simultaneous applications to the NAI program, as well as to the various NASA Center NRC programs. Our program continues to support two review cycles per year; with application due dates of February 1 and August 1.

NRC Associates selected through the NAI/NRC Program become full members of the NAI, and, as such, are included in the NAI database and online directory, invited to attend and submit abstracts for NAI General Meetings, given access to NAI collaborative tools, and are eligible for additional NAI funding opportunities. NAI/NRC Fellows have, therefore, a wide spectrum of opportunities for further collaboration with NAI researchers, as well as the broader scientific community. In this role, NAI Fellows act as 'Ambassadors' amongst the NAI Teams, and between the NAI and the broader scientific community, – helping to define and lead the new discipline of astrobiology. Go to the NAI/NRC Fellows section of this report to read about the activities of our current group of 5 Fellows.

#### NAI Research Scholarship

The NAI Research Scholarship Program offers stipends and research-related travel expenses to allow students (graduate or postdoctoral) to conduct collaborative research amongst two or more of the Lead Teams, including all of the participating institutions of the NAI. The program also supports travel to field-sites when required for the progress of the student's research. Recipients of NAI Student Research Scholarships during this past year included:

- James Hall (CIW), to support his participation in the Flores Workshop for Scientific Drilling in Lake Peten-Itza, Guatemala ( August 10–16, 2003 )
- Andrew Hock (UCLA), who conducted work on the physical limnology and environment of the Licancabur Volcano crater lake, as an analogue to possible ancient lakes on Mars, and

- Rory Barnes of the University of Washington who visited NASA Ames Research Center to collaborate with Ames researchers in the area of planet formation.

#### NAI Student Poster Competition

The AbSciCon (Astrobiology Science Conference) 2004 meeting (28 March–1 April 2004) included a Student Poster Competition sponsored and implemented by the NAI. This competition provided motivation, encouragement, and special recognition to the most promising astrobiologists of the future. It carries on a tradition from the AbSciCon Meeting in 2002, with certificates for 3 winners and prizes of \$500, \$750, and \$1000.

Significant efforts for this year's NAI Student Poster Competition for the AbSciCon 2004 were a meeting website description of the competition requirements, abstract submission, poster procedures, and winner criteria. NAI Central managed the poster staff, the student presenters, arranged for the 6 judges to cover the 16 subject disciplines of the meeting poster topics, and prepared the certificates and check payments for the poster winners.

#### Education and Public Outreach (E/PO)

NAI Central coordinates and leads the overall E/PO program for the Institute by bringing the teams together for monthly telecons to share information, seeking out and sharing collaborative opportunities, supporting specific projects with a broad or national reach, and maintaining webpages for teachers and students. In addition to bringing the teams together for monthly conversations, NAI Central supported travel to the Astrobiology Science Conference and the associated Executive Council meeting for an in-depth meeting on all of the NAI's E/PO efforts. Discussions at these sessions led to changes in the overall program including the development of a fund available for cross-team E/PO collaborations, additional professional development for E/PO Leads, and new representation of the E/PO Leads on the Executive Council.

NAI Central E/PO projects this year ranged from web-based activities for middle school students to support for museum exhibits and national television programming. The details of the NAI Central led E/PO projects are outlined in the [E/PO report](#).

#### Infrastructure

##### Collaborative Tools

Designed as a virtual institute with distributed members across the country and even around the globe, NAI has explored various technologies to support scientific collaborations. During the last year, NAI Central reevaluated the approach to collaborative tools. After five years of observing usage of the tools, NAI Central found significant differences in each group, resulting in a wide variety of requirements. As a result, NAI Central focused on providing as many tools as possible, in addition to providing information about the availability of additional tools not currently offered through the Institute. This approach allows the teams to select the tools most appropriate for their needs with NAI Central providing some of the basic or most common ones. NAI Central attempts to customize and tailor tools to individual teams and groups whenever possible to allow for the most flexibility in meeting needs and requirements for unique

collaborations.

The two most commonly used tools in the NAI community have been WebEx and the **Polycom videoconferencing systems**. Polycom is one of the industry leaders in videoconferencing systems, providing high quality, simple, reliable, protocol based (H323 and H320) videoconferencing capabilities. Polycom systems have been provided to each Lead Team, enabling simple and high quality videoconferencing capabilities between all the teams at any time. In some cases, Polycoms or the ViaVideo desktop videoconferencing systems have been provided to co-Investigators at additional institutions, expanding the possibilities for both cross-team and intra-team collaborations. Support of ISDN lines for the Polycom systems was discontinued this year, and use of Internet Protocol (IP) connections were substituted after quality and reliability testing were completed. IP connections have been successful, even surpassing the quality of ISDN in some cases. This shift resulted in a significant savings the Institute. ISDN connections are still supported through the Multi-point Controller Unit Bridge at Ames, but the lines are no longer paid for by NAI.

**WebEx** is a synchronous meeting application that runs over the IP based network. It allows people to share a variety of files and applications real-time from any computer on the internet. With WebEx, shared documents for a meeting are cached locally on each participant's machine, so that when a "presenter" advances a slide, image or document, all the other sites' slides are advanced instantly, ridding the audience of any latency issues seen in comparable software. This has worked extremely well in the virtual seminar series. WebEx also provides real-time chat and polling capabilities, video streaming, Voice-over IP (VoIP), application sharing, desktop sharing and web sharing. With application sharing and desktop sharing, participants can use each other's software or even the entire computer remotely. This allows for real-time collaboration on authoring papers, analyzing data, running experiments etc. For more information about this tool and how your team can use it, please contact Estelle Dodson.

**Gateway pages** are customized webpages for use by a group or team developed by the staff at NAI Central. Once set up, gateway pages are maintained by the group membership. These pages are used to share files, maintain a calendar, conduct discussions, keep membership/contact information and more. Available features include threaded discussion forums, email lists, calendars, and document management/file uploads. To set up a gateway page for your group, contact Marco Boldt.

**Pageseeder** is a web-based document sharing and annotating tool that was piloted this year at NAI. It was found to be a well-designed tool with a good interface, but did not fit a need of the NAI community. It will not be further supported through NAI.

A new asynchronous collaborative tool was made available at no cost to NAI through a partnership between NASA Ames Research Center and Xerox PARC. The produce is referred to as "**NX**" for NASA Xerox. NX provides users with an online space for collaboration using a variety of features. It offers online file storage and sharing with extensive read/write permissions based on



individual users and specified groups. One features of NX that stands out from the many online collaborative tools are called interact pages. Using interact pages, workgroups can create customized interactive pages, discussion forums, meeting agendas, project management pages, and tables. NX also provides document version control, routing capabilities and archiving. It has an online calendar, group email capabilities, bulletin boards and extensive search capabilities. For information on obtaining an NX account, contact Estelle Dodson.

The **Member Services** area of the NAI website contains a variety of useful features, including a section of information related to the operations and meetings of the Executive Council. Logistics information for all in-person meetings of the Executive Council can be found here, and minutes from both in-person and videoconference meetings are posted for all members to review. Other documents relating to the business of the Executive Council, including its charter, are available for download, as is the Handbook for NAI Teams, a highly useful central compendium of the operational precedents, current policies and procedures, expectation of Team participation, and other NAI arcane. Also in Member Services are the NAI e-mailer, online discussion forums, and the Photo Directory.

The **Photo Directory** is a simple, but useful, tool provided by NAI Central to all members. It is accessed through Member Services and provides members' names, titles, email addresses, addresses, phone numbers, disciplines, and institution affiliations. The Photo Directory is updated each year when the Lead Teams submit their annual reports.

#### Executive Council

The NAI's Executive Council (EC) is made up of the Principle Investigators (PIs) of each of the Lead Teams and the Director and Deputy Director of the NAI. NAI Central coordinates monthly meetings of the EC. During this reporting period, Nine of these meetings were held by Polycom, and an additional 3 meetings were arranged in person at Jackson Hole, San Francisco, and Mountain View. NAI Central provided agendas, logistics, technical support, and minutes, as well as video tapes of the virtual meetings. Minutes of the meetings are available at